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NOTES ON MYOPIA*

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In the May, 1931, issue of *The American Journal of Optometry*, pages 171 and 172, is an editorial over the initialed signature, C. C. K. (Carel C. Koch) titled, "The Causation of Myopia." In this paper certain ideas and methods as to the handling of myopic cases are attributed to Peckham and McCulloch. The writer seems to confuse the technics developed in clinical practice and described by these two, with some speculative ideas advanced by others. Neither McCulloch nor Peckham have ever entertained or promulgated the unsound notions wrongfully ascribed to them in this editorial. Beyond saying that I know that Dr. McCulloch, who is an extremely cautious and conservative experimenter and writer, is entirely in disagreement with the fallacies presented by the editor of this journal, I do not speak further for him. It does seem advisable, however, to make some restatement of materials already presented, in the way of correction, or disclaimer, lest the readers of this journal be misled into supposing we have any sympathy with or responsibility for the erroneous and unreasonable concepts that the editor so unjustly imputes to us.

Base-in Prisms

Speaking of the use of base-in prisms for myopic cases by Peckham and McCulloch, he states, "As is well known these men advocated crowding on as much base-in prism as could be accepted for near point work in the effort to enable the child to do his near point work with as little effort on the part of the convergence as possible."

But neither Peckham nor McCulloch has ever advocated any such thing. You may look through the published writings of either, or through notes of lectures by either, and you will never find a statement supporting or a direction to follow such an unwise procedure as "Crowding on all the base-in prism as could be accepted for near work." I say,

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"Unwise," for early in my work with base-in prisms I found not only the unwisdom, but the impossibility, of such proceedings.

On the contrary, it is generally unwise to interfere with the developing integration of innervation of the convergence and accommodative muscles in children, unless the examination reveals that these desirable associative habits are not developing properly. In adults, interference with an imbalanced habit of integration is often necessary. These statements apply to both myopes and hyperopes.

Very unfortunately, as it has turned out, a few years ago, after ample demonstration of the value of the use of base-in prisms in cases of pseudo-myopia, a prominent Optometrist, well known for his constructive work, publicly suggested the experiment of using for close work an amount of base-in prism equivalent to the meter-angle of convergence. I suppose this was on the theory that if a spoonful of medicine is efficient, the whole bottle would be still better. At any rate, he proposed this as an experiment only. He did not state that he had tried it, nor that it would work. He made the suggestion in the hope that a large number of men would try it. They did—without success. Now enters the unfortunate part. A prominent "clinician," seeking something new to ballyhoo, seized upon this and bruited it about the country, without taking the trouble to find out if it were workable. Scores of men, giving implicit trust to the lecturer, tried it—with disastrous result. The pity is that the first to propose the experiment did not promptly announce the failure. For those who were fooled came to look upon the whole procedure of using prisms in myopic cases as a snare and delusion, for which attitude they are not to be blamed.

But that anyone should confuse the explicit instructions for the use of base-in prisms in the distance correction that our group worked out in years of controlled experiments, with this untried plan, and should attribute this use of heavy prisms for near work to me, comes with something of a shock. It would seem that no matter how carefully one works, nor how carefully and precisely he writes, careless readers will misinterpret and misquote.

All who have experimented thoughtfully with base-in prisms for myopic cases, with patients who were under control and could be kept under observation for long periods of time, have found in the vast majority of cases that any improvement in the way of reduction of the apparent myopia, or in bettered vision, or in greater comfort, has resulted from the constant wear of the prisms in the distance correction. Only rarely can additional prism power be used for near, or if used, only rarely is it beneficial save in one particular group of case types. Generally the use of more prism for near than for distance increases the discomfort or creates discomfort where none was experienced before. The conditions under which added base-in prism for near work is justified and the amounts that can be successfully used are set forth in detail in "Modern Treatment of Binocular Imbalances," 2nd Edition, 1928.

I first discovered that base-in prisms would in some cases reduce an apparent myopia and improve comfort in the fall of 1919. In the beginning I used the amount of prism that would "optically correct" the distance exophoria. I found comparatively few myopes who were helped by this procedure. By "helped," I mean that the apparent myopia was reduced, as demonstrated by the requirement of less minus to give good vision and as shown by the reduced minus found by skiametry with the prisms in place; or that vision was improved by using base-in prisms together with the same amount of minus as found objectively and subjectively; or that both the apparent myopia was reduced and the vision made better when base-in prisms were incorporated with the minus lens correction; or that the patient was made more comfortable by the use of base-in prism although neither the minus was reduced nor the vision improved.

Further, I found that some persons were made very uncomfortable by the base-in prisms that "corrected" their exophoria. But some were greatly helped by less prism than the full correction, while others were helped by much more prism than called for as a "correction" of the exophoria. As the years went by, I learned that the phoria test is a poor guide for the prescription of prism to myopes. So far, the information yielded by the duction tests has proved far more useful.

Back in 1920, no one had pointed out that phorias are continually shifting both in character and amounts; that the findings for the same person will be different at different times; that different methods of testing will give different findings; that the findings are of temporary character only. Rather, we were taught that a single test sufficed, that the findings were absolute and that they showed the congenital structure of the extrinsic muscles of a pair of eyes. Of course, this idea is no longer held by those who have done any investigative work at all.

It seems as though there must be some way of arriving at prism prescriptions by a more scientific method than the ones we are using. Even though we get fairly level results by basing prescriptions on phorias and ductions, yet such methods do not seem entirely logical nor perfectly sound to me. I know of no better way, yet I am hoping that by experiment and study of the results obtained by these methods, some one is going to find a more substantial, more satisfying technic. It was by study of the results of basing prism prescription on phorias that I learned the weakness and inaptness of that method and the relation of the ductions to the acceptable prism. But this latter method is not fully satisfactory; it is but a stop-gap to be used until we can learn more.

I did not know, in 1919, that the use of base-in prisms in myopic cases is not a new thing. It was not until 1929 that I saw R. D. Allen's "Science of Higher Prisms," published in 1895, and learned that he had successfully used base-in prisms for the reduction of pseudo-myopia and also for the uncovering and correction of latent hyperopia. I did not know until 1930 that this use of base-in prisms for myopic cases

has been in use by the German refracting ophthalmologists for at least half a century and that it is their routine procedure to this day, is taught in their schools. Last summer I came in contact with an elderly gentleman who was given base-in prisms for the reduction of myopia thirty-five years ago, when a student in Berlin. In the past few years I have found that the American ophthalmologists who went to Germany to study refraction in the period from 1880 to 1900 were all taught to use base-in prisms for the reduction of pseudo-myopia and also base-in prisms for cases of esophoria. And they used those methods in their practice here. I have met a number of physicians and optometrists who studied with these "old-timers," who learned the use of prisms from them, and who are now using the prisms for these purposes. It is not now the style for Americans to go to Germany to study refraction; they run over for a few weeks to get pointers on pathological cases only. Hence, the moderns are not learning what the German refractionists are doing.

As Dr. Pollack pointed out in a recent paper, when the American ophthalmologists and optometrists fell under the influence of the English school of speculatists, they were led into wrong roads. If we could but return to the experimental methods of the German school, if we could free our minds of the fallacious theories of the English and French speculative writers, brought to this country by Stevens, Savage and their ilk, if we could but work with minds unprejudiced, as did Donders, Javal, Helmholtz, and their colleagues, how much we could learn, how fast we could advance, now that we have better equipment and more trustworthy knowledge of anatomy, physiology and psychology!

The wonder is, since this use of prisms has been in use for so many years, how does it happen that our school masters know nothing of it? We have been trusting them to acquaint themselves with the literature of refraction and of ophthalmology and to pass the results of their studies on to us. Have we then been trusting too blindly? It looks as though they were not the students we thought they were. But even now that the evidence is before them, brought out by the work of scores upon scores of American optometrists and ocultists, many of our erudite speculative thinkers, in our University schools of Optometry, call it a "Theory." What they mean is that the practice does not fit into their theories, and they are afraid to put their theories to the test of practice.

Nothing is more pitiful than the spectacle of the man who says he has "Never seen a case of myopia reduced by wearing base-in prisms." On the face of it, he hasn't seen much, nor handled many myopes. Nothing is more ridiculous than the man who says "It can't be done," and so declines to try, when it has already been done and is in every day use by many. But still, I suppose there are still men who say an æroplane cannot fly. I know I hear voices over the radio every day, but I'll admit I cannot believe such a mystery is possible

My own discovery that a pair of weak base-in prisms would take the place of a pair of weak minus spheres and give more comfort to the patient, in 1919, was purely accidental. However, I did have the curiosity to repeat the experiment with occasional cases of low myopia. Sometimes it worked, sometimes it did not. Through succeeding years, however, I was able to work out a technic whereby it almost always worked. But it does not always give immediate results. I found that most cases would require from two weeks to a month of prism wearing before the tensed muscles would relax. An occasional case requires much longer.

First experiments were with low mypoia only. But emboldened by considerable success with these, I began to work with the prisms in all cases of mypoia where I could have control of the patients and see them at frequent intervals. Then I found that exercises would hasten things along, sometimes bring success where prism wearing alone did not accomplish much.

The first publication of these findings and description of the methods was in the spring of 1925, after five and a half years of experimenting. By the fall of 1926 further material had been obtained, which was published in the first edition of "Modern Treatment of Binocular Imbalances." By 1928, with two more years of work, and now with the assistance of McCulloch and others, more details of a working technic had been developed, which were published in the second edition of "Modern Treatment."

Since that time, no one seems to have added much of usable or of sound value. Some rather desultory work of a few months duration was done in the clinic of one of the optometry schools; but as it was done in a slovenly way, mixed up with some unproved theories, was not carried on long enough to produce definite results and was ruined at the outset by the adoption of an unworkable technic, the published report has been of no assistance to students or practitioners. Numbers of individual case reports have been published by optometrists in various journals, which encourage us, in that they demonstrate the possibilities and advantages of these attempts to bring a pair of myopic eyes into balance; but these encouraging case reports have not developed new points in technic. We have a number of case reports where the myopia has been reduced by base-out exercises, which demonstrate that in some cases such a method is feasible. But these reports do not contain enough diagnostic material to enable us to ascertain in what way a case to be helped by base-out exercises differs from a case where the work should be done with base-in prisms.

True Myopia and Pseudo-myopia

That many cases apparently myopic are not truly so but are in fact hyperopic has been recognized from the earliest days of the practice of refraction. This condition of apparent myopia has been well termed "pseudo-myopia." It has been explained by the term "Spasm of the

accommodation." The theory has been that through some untoward event the muscles of accommodation have been thrown into a state of hyper-tonicity, or muscle spasm, or tetanus, so that the crystalline lens is held permanently in convexed state, with the result that the image of a distant object is focused in front of the retina. There is no evidence in the writings of investigators of this phenomenon that they considered that the eye ball is elongated in cases of pseudo-myopia.

It has been stated that in true myopia the eye ball is elongated. But always in considering the optical value of the anterior-posterior length of the eye ball, it must be estimated in its relation to the dioptric value of the lens system. The curvature of the cornea is an essential factor in this dioptric value. Hence, the correct description of the myopic eye would be the statement that it is an eye in which the anterior-posterior is longer than the focal length of the dioptric system of that eye; or, that the focal length of the dioptric, or lens, system is less than the anterior-posterior diameter.

This condition can be brought by any one of three factors or through a combination of any two of the three, or by all three together. The three factors being: 1st, an actual distortion, or lengthening of the eyeball, the corneal curvature and crystalline lens convexity remaining unchanged; 2nd, an increased convexity of the crystalline lens, the diameter and corneal curvature remaining unchanged; 3rd, an increased curvature of the cornea, the diameter of the eyeball and the convexity of the crystalline left unchanged. Sheard and others have pointed out the distinction between "axial myopia" and "curvature myopia;" the latter being due to a high corneal curvature; the former to a definite lengthening of the diameter of the eyeball. All writers also recognize the myopia effected by a permanent convexing of the crystalline due to a spastic condition of the accommodative muscles, the so-called "spasm of the accommodation." There is plenty of evidence that there are cases in which two of these factors may be present; other cases in which all three are present; other cases in which we seem to find but one. But we must admit, we must do more than admit, we must definitely recognize, that at present our knowledge is so limited that we have no way of ascertaining which of these factors is present, or may be present, or is absent, in any given case of myopia when me wake our first examination. Following a case through, with frequent studies of changes that take place, over a period of several years, sometimes does bring to light enough data to warrant the tentative assumption that one or two of the factors might be absent in the particular case.

For example, if over a period of four or five years, we find that the apparent myopia has changed to hyperopia, then we could eliminate the factor of elongation of the axis. If the corneal curve flattens, then we would be safe in thinking that this was a factor in the pseudo-myopia; but if the corneal curve remains unchanged while the amount of myopia reduces, it is logical to presume that the hyper-tension of the accommodative muscles is a factor; and so on.

If the myopia is not reduced, or if it is but partially reduced, are we then safe in assuming that the eyeball has actually stretched? I think not. The corneal curve might still be a factor; the tetanus of the accommodative muscles might have become complete, so that no breaking down of the tetanus is possible through any means with which we are now conversant.

Examination of some enucleated highly myopic eyes has shown that they are of greater posterior-anterior axial length than the axial length of enucleated eyes that were known not to have been myopic. But this is not proof that all eyes apparently myopic in life time are actually elongated. It is only proof that the eyes examined were elongated. The assumption that all apparently myopic eyes have become elongated is not warranted by the very little work that has been done. Comparatively few enucleated eyes are turned over to the dissectionist. Most eyes enucleated during life time are pathological. The dissectionist is unable to obtain very many eyes of known history, so far as their refractive status goes.

Koch, in his editorial, states that the use of prisms shortens the posterior-anterior diameter of the eyeball. I can see no logic in such an attitude. It would seem highly improbable that when the sclera has actually commenced to stretch, any method now known to man would make it shrink again. Any effect produced in reducing a pseudo-myopia must be either through flattening the corneal curve or in breaking down the hyper-tension of the accommodative muscles, or in some cases. through both.

I doubt if we have any means of reducing a true myopia. But it has been shown that in many cases of apparently true myopia the visual acuity and the comfort of the patient can be improved by wearing base-in prisms, or by exercises, or by a combination of the two methods. although the amount of minus needed is not changed.

I have been working on this problem of handling myopic cases for twelve and a half years. I have not yet found a means of determining whether or not any case is pseudo-myopic, truly myopic, or partly pseudo and partly true. Two or three times I have thought I had found a clue that would lead to a solution. But soon some case would develop data proving that the trusted clue was untrustworthy.

Tait announces that he has a way of telling how much the myopia can be reduced. Skeffington advertises, in his broadsheets, that he will teach attendants at his clinics how to tell how much the apparent myopia may be reduced. If either of these eminent teachers will work twelve years on the problem and handle a large number of cases, keeping many of them under observation for five, six, eight years, I believe they will retract these statements. If either of them had worked on the problem for five years before making any public statement, I doubt if they would have published the material in the form they have presented it.

It is easy to determine how much the apparent myopia will be

reduced within a few weeks. It is impossible to know what is going to happen in a long period of training. To illustrate with a case: A girl of 12 came to me in 1927, wearing, Rt., —6.00 D. Sph. ⌒ +1.50 D. Cyl. Ax. 115 giving vision 20/50; Lt. —6.00 D. Sph. ⌒ +2.00 Cyl. Ax. 75, giving vision 20/200. Changing the cylinders to +3.50 in both eyes, at the same axes, improved vision very slightly, but not enough to make smaller Snellen letters recognizable. The opthalmologist who had had the care of the child for many years, told the mother that as each year the amount of the myopia had increased, he was fearful of increasing the minus lenses, lest the very increase should tend to make matters worse. Added minus did not improve vision when the child was brought to my office. There was no evidence at the first examination that the amount of minus would ever be decreased. I undertook the case in the hope of improving vision, but with no expectation of reducing the myopia or the lens correction. The case has been under constant supervision since that time. In February, 1932, the correcting lenses are: Rt. —2.50 D. Sph. ⌒ +1.50 D. Cyl. Ax. 90, giving vision 20/20; Lt. —2.50 D. Sph. ⌒ +2.00 D. Cyl. Ax. 90, giving vision 20/20. The vision has been brought to normal, the apparent myopia reduced. Vision without glasses is a poor 20/80, O. U.

Another case. Girl of 15, in 1926. Wearing no glasses. Requires O. U.—1.50 for 20/20 vision. O. U. 4△, bases-in, give vision 20/30, without minus lenses. Six months later, the same prisms give vision 20/20. Vision now without glasses, 20/30. She stopped wearing glasses and I did not see her for over a year. Then she came in, myopic again, needing —2.50 to give 20/20 vision. Vision without glasses, 20/80. Vision with O. U. 6△ bases-in, 20/40. Vision with O. U. —1.50 ⌒ 4△ bases-in, 20/20. Hence, we would assume that 1.00 D. of the myopia had been eliminated. But skiametry with the base-in prisms in place gave —2.50 D. Sph., and skiametry without the prisms gave —2.50 D. Sph. We gave the plano prisms, the pair 6△, for wear. At the end of two years vision with 2△ bases-in was 20/20, skiametry with the prisms, 0.00, skiametry without the prisms, —0.50 D. Sph. One year later, skiametry without prisms, 0.00. Vision without prisms and without minus spheres, 20/20. This was the result of four and a half years work.

It does not seem wise to me to undertake a myopic case unless the patient can be seen at fairly frequently intervals and plans for several years of observation.

Out of 54 apparently myopic children, under 10 years of age, to whom base-in prisms were given, in the years 1922 to 1928, only one showed an increase of myopia. This child did not come with regularity and I do not know whether the myopia would have increased or not if we had been able to see her regularly. She was a pronounced pituitary-trope, excessively fat, and the myopia increased as she grew fatter. I do

not know whether this was merely a coincidence, or if the two evidences of functional disturbance had any relationship.

Three items of a required technic for handling pseudo-myopia have become very apparent. One is that the prism power needs frequent change. Another is that the selection of prisms must be individual; there can be no set prism power, the same prism for every case. For in some cases the myopia continues to increase with a weak prism while with strong prisms the tensions commence to relax. But in other cases, the reverse obtains; strong prisms are intolerable and it might be that the very discomfort induced tends to increase the hypertensions, but with weaker prisms benefits follow. There is an occasional case, as described in "Modern Treatment of Binocular Imbalances," where no prisms can be given for distance but very weak prisms, not over 2△, can be given for near work. (That is not "Crowding on all the prism that can be worn.")

The third item is that the minus correction must be built on the prism prescription. With the prisms before the eyes, the minus correction is built up step by step. Very seldom will a myopia decrease when the prisms are added to the minus correction obtained without prisms.

The 75 cases of myopia reported by E. F. Tait, in which he gave 2△ base-in on each eye to every case, merely informs what happened to 75 myopes to whom a pair of 2△ base-in prisms were given. This is of no value in furthering knowledge of what can be done for pseudo-myopia, save the negative information that this set prescription of 2△ O. U., does not produce much in the way of results. From this we can really demonstrate an important point, namely, that the prism prescription must be individual. The report is not a scientific exposition, for it supplies no data showing the differences between the cases in which the myopia was reduced, those in which it was not reduced, those in which it increased during the treatment, those whose apparent myopia was considerably reduced and those where there was but a very slight reduction. Nor is it a completed piece of scientific work, since no attempt was made to find out what would happen to the cases if other powers had been used than the arbitrarily chosen pair of 2△ prisms.

The work of the physiologist Adrian has amply demonstrated that physiological reactions are highly individualistic and that there is no uniformity of result when identical stimuli are applied to a large group of subjects; but that to obtain usable data in any physiological experiments, when calcuable results are wished, the individual must first be studied to determine the stimuli required to produce results on a parity and comparable with results produced by the experiment on other individuals.

Hence, if we would further advance our technic for dealing with pseudo-myopia, we must discover a method for determining the best prism for the individual. So far, the most efficient method has been the

use of the abduction tests. But I am sure that eventually a far better technic will be discovered.

Bifocals

Some optometrists have had very excellent results in cases of myopia by using bifocals, especially with small children. One or two have made very audacious claims, such as, that progressive myopia is invariably arrested by the use of bifocals. I think they have not handled very many cases.

In the years 1922, 1923, 1924. I put bifocals on every myope. regardless of age. In a number of cases they produced so much actual discomfort that I had to remove them. In some cases, they were actually a help. In a number of cases the myopia continued to increase. So bifocals, with repression of the innervation of the accommodative muscles, will not invariably reduce myopia nor will such treatment invariably arrest the progress of a continually increasing myopia. Sometimes they do, sometimes they do not.

The average practitioner does not have enough of any one type of case to be able to establish anything with certainty. Nor is he able to keep a very large percentage of his cases under constant supervision. I was very fortunate in the years from 1921 to 1927 to have a connection with an institution, a city dispensary, where a great number of indigent children were sent from the schools for eye care. These children could be kept under control and observation. Otherwise, I know very well I could not have accomplished much with the experiments conducted. Nor could I have collected much worthwhile data.

Under the theory that pseudo-myopia is a "spasm of the accommodation," that it develops because of excessive use of the eyes for close work, and under the theories of accommodation that prevail, it is a plausible conjecture that repression of accommodation by plus lenses will tend to relax this "spasm of the accommodation." The first instance that led me to doubt the universality of that theory was when a girl of 10 came to me, wearing a pair of +2.00 D. spheres, but myopic, and needing a pair of —5.00 D. spheres to give 20/30 vision. The plus spheres had been fitted a couple of years previously by an optometrist whose skill I had learned to hold in respect. So I visited him and found that when she was fitted her vision without glasses had been 20/40, that she had needed O. U. +1.25 D. Sph. for 20/20 vision and she had accepted O. U. +2.00 D. Sph. without blur. Hence, wearing the plus spheres had failed to inhibit "spasm of the accommodation," for in two years she had become myopic in spite of the plus spheres!

Eventually, I found that when added plus will increase the near abduction, either on the breaking or recovery points, then bifocals for the myopic young person are of very great value. They do not seem to help much in other cases.

Nothing is universal. I do not believe we know how to arrest the progress of every case of progressive myopia. I do not even surely know

that we can arrest any case. All I do know is that in some cases that have shown a continual increase of myopia, requiring each few months stronger lenses, the myopia has not further increased when we gave base-in prisms, or bifocals, or exercises, or a combination of any two of these, or of all three. But it is quite possible that all of these cases had reached a stage of metabolism where the myopia would not have further increased had we done nothing whatever. Still, it does seem as though some of the cases, out of the thousands that have been successfully handled by the optometrists of the United States and Canada during the past six years, might have continued to progress to higher degrees of myopia had nothing been done. It is merely an unanswerable question. No optometrist of scientific mind will state that he has a panacea for progressive myopia, whether it is bifocals, or prisms, or whatnot. For the evidence is against him. Some continue to progress in spite of all of our efforts.

Functional and Organic Myopia

The term "Functional Myopia" has been introduced to replace the term "Pseudo-myopia;" "Organic Myopia" is substituted for "True Myopia." The idea seems to be to definitely recognize the fact that apparent myopia is not always factual myopia, but may have been brought about by some functional imbalances. By "Organic Myopia," I presume is meant the condition of an elongated axial depth, i.e., a structural state of the eyeball itself that cannot be changed. The question that arises, as to acceptance of these terms, is whether or not they are truly descriptive. It is quite within the realm of the possible that all myopia is a symptom of functional disturbance.

Are any babies born myopic? That is a matter that has never been investigated. Every now and then I read some such statement as "Less than 2% are born myopic." How did these writers learn that? I have never seen records of the examination of the refractive status of new born infants. Are any infants born myopic? There is no record. How in the name of sensible thought, can any one make a statement that less than a certain percentage, or more than a certain percentage, or any percentage at all, or even one case, has been born myopic? It might not be a bad idea to equip all obstetricians and midwives with skiameters and instruct them how to get a peep at the "elusive shadow movement" the instant baby arrives, before bundling it in its coddling clothes, even before sterilizing its eyes with bichloride of mecury, perhaps even before it emits that first plaintive wail that announces its arrival in this vale of trouble and tears. It might even be better to delegate these unscientific scientists to personally attend these births and ascertain the truth or falseness of their "less than 2% congenital myopes" asservations. Seriously, we know nothing nor can we know anything but nothing about "congenital" myopia or about "organic" myopia for a good many years.

All that we know is that a great many children that at one time were known not to have been myopic have become myopic. But in the

majority of cases, the condition of myopia is unknown until some school teacher discovers that the child does not see the figures on the blackboard and insist that it be given glasses. The statement of the parent that "She always did see well until a couple of years ago," is worthless, usually misleading. For the parent knows nothing whatever about how well the child did see or did not see. We only guess that the child became nearsighted. We don't know when nor how.

The Causation of Myopia

About all that has been definitely learned as to the disturbances that culminate in myopia is that the earlier speculations had no experimental basis.

Koch and others, quote as established fact the speculations of Lewissohn about posture as a factor in causing myopia. But work done in Vienna in 1924-28 has shown that posture cannot be a factor. Lewissohn's statements were guesses only, not very good guesses. In that they are not so very different from a great deal that has been written about eye functions and dysfunctions. A brief summary of the experimental work done in Vienna and in the German clinics in one of our ophthalmological journals, in June, 1929. (I think it was *The American Journal of Ophthalmology*. Will the man who borrowed my copy, if he reads this, please return it? No questions asked.) The German periodicals of physiology have published a great deal of this material in the past four or five years. The posture theory is definitely thrown out.

Koch, in his editorial, states that "It is known that myopia is inherited." Is it? Isn't that a pretty strong statement, when the simple fact is that nothing whatever is known about heredity? There are lots of guesses, but nothing known. No biologists will make a direct, unmodified, statement about heredity. It is true that some myopic children have myopic parents. It is also true that some non-myopic children have myopic parents and that some myopic children have non-myopic parents.

If it is finally shown that myopia results from certain chemical imbalances, and that these are inherited chemical imbalances, then it may be possible to state that some types of myopia are inherited, or that a disposition to myopia of certain types is inherited or inheritable. But the day of that final showing is somewhere in the future.

Koch also states that the advocates of the base-in treatment for myopia have promulgated the theory that pressure on the eyeball by the internal recti causes its elongation. That is new theory to me. It does not sound very plausible. A good many years ago, text books taught that pressure on the eyeball by the external recti caused an elongation of the eye, producing myopia. That did not sound very good, either. Both these may be dismissed as mere speculations. There are no experimental data to support or contravene them.

Then there is the story of the mechanism of convergence and accommodation. That is very plausible. When I first found that base-in prisms would sometimes reduce myopia, I thought to explain it on the

mechanistic theories of convergence and accommodation, as taught by Maddox, Bestor, Sheard, and others. It is a very pretty explanation. The trouble is that the mechanism of convergence and accommodation and the inter-relations of these, as worked out by these philosophers, are suppositious only, were never based on experimental research, and are rather dubious philosophies. In earlier days I gave them credence, accepted them without hesitation, for I could not dream that such great men would make such positive assertions without experimental background.

That through the inhibition of convergence by base-in prisms the associated accommodation is likewise inhibited is a good explanation. But it is not enough explanation.

That because of application through long hours of close work the muscles of accommodation become hypertonic, enter a state of tetanus, is a pretty explanation. But it does not suffice. There must be some other factor.

I have in mind a college professor who is a myope. When he does two or three months of steady close work, he becomes more myopic, by two or three diopters. Then he rests and the newly acquired myopia disappears, his eyes return to their original state of about one and a half diopters myopia. That is one case supporting the close work idea. But at that it does not suffice. More people ought to have similar experiences. I suppose there are a few others. But to substantiate the theory, the majority of people ought to behave likewise. But they do not. There must be some other factor.

Sir Arthur Keith has established that some myopes are cases of calcium deficiency; attributes this to endocrine dysfunction. I have found a few cases of myopia who were cases of calcium deficiency. I believe some work was done along this line in a Detroit clinic a few years ago. But that does not explain pseudo-myopia.

We do not know anything about the cause of myopia. No doubt there are a multitude of causes, and there must be some physical conditions that permits these various contributing factors to become actively malignant.

Some one advanced the theory that the person with wide interpupillary distance becomes myopic, "Because his convergence requirement is in excess of his accommodative requirements." That is along the line of theory advanced some years ago that the high exophore would become myopic. "Because his convergence requirement is in excess of his accommodative requirement, and given a close association between the two, convergence would carry accommodation beyond the focus point." It is very pretty, as a mechanical explanation. I accepted it in full, made up charts to show how it happened, because I put my faith in men who used large words. Now that I have learned they were merely guessing, I doubt every word of it; simply because all the theories of the "faculty" of accommodation, of the "faculty" of convergence, of the "faculty" of fusion, of the control of the "function" of accommodation over the "function" of convergence, of "accommodative-convergence" and of

"convergent-accommoadtion," of "fusional convergence," of "fusion reserves," and so on, have been deflated.

There is some evidence that one type of myopia has its origin in over activities of the gonads; but this may be co-incidence, the fact is not established.

Along in 1928, I shot a guess, "That when the mysteries of the endocrine glands were revealed, the riddle of myopia would be answered." Oddly enough, evidence is accumulating that the guess was not so bad. But it is not a very profound statement. For it seems that the endocrines control all our physical and mental activities, that they are the governors of metabolism and the regulators of personality, that imbalances and dysfunctions of the endocrines are at the root of all evil. It would appear that when "The mysteries of the endocrines are revealed," most of our riddles will be solved.

I do think that sufficient data has been obtained to show that myopia is a symptom of disturbances, or dysfunctions, in the autonomic system, and of course that includes the functionation of the endocrines. Then follows what those who are observant have already surmised, that there are different types of myopia—therefore, there will be needed different methods of control for different types.

What we need at the present is more study of the characteristics of these different types. It is useless, worse than useless, to speculate and theorize. The theorist is a nuisance, he obstructs progress. We need to collect data, and to collect data in such a way that it speaks for itself. To attempt to formulate a theory from data will but lead to error, for who knows if he has all the data? To attempt to force conclusions from the collection and arrangement of data is to follow the short road to error. Data properly collected and classified points to its own conclusions, but always those conclusions must be accepted tentatively, in the attitude of disbelief. For the collection of data teaches how to gather more data. And new data added always points to a different conclusion than that derived from the first, incomplete, collection. But never is all the data gathered. Always there is something previously unknown that will turn up.

Only through constant experiment can we progress. If we do certain things under certain conditions, always the result will be the same. The point is, up to date our methods of knowing conditions are so imperfect that we are not always certain that the expected result will follow. Therefore, if we plan to benefit our myopic cases, by using bifocals, or base-in prisms, or full corrections of minus lenses, or by whatever method, it behooves us to train our habit of observation so that we may know with some degree of assurance when one method shall be used, when another.

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OPTOMETRIC INTERPRETATION OF FUNDUS ANOMALIES, AND WHEN AND WHEN NOT TO PRESCRIBE TINTED LENSES*

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That which follows is written under, and by the dictates of a policy of Optometric practice, which I feel is obligatory, as it conforms to, and is confined within, the scope of our work. Each and all of us is charged with responsibility to recognize and differentiate between an eye in good health, and one that is affected by, or possessed of pathological processes.

This paper wil confine your attention to the differentiation of a NORMAL from an ABNORMAL eye, with respect to the fundus.

It is very apparent that much confusion exists as to what constitutes the work of the Optometrist with reference to pathology. One group of men vehemently contends that we, as Optometrists, have prescribed the full limit of our duty to the patient, when we have determined that an actual or suspected pathologic process is present; while another group just as vehemently contends that our duty has not been fulfilled until the CAUSE FOR the ocular affection has been determined.

The PRESENCE of any pathologic disorder that AFFECTS VISION can positively be determined by the HISTORY of the case, and REPEATED observations by the OPHTHALMOSCOPE, CAMPIMETER, and the PERIMETER. However, the DETERMINATIONS OF THE CAUSES FOR, AND THE DIFFERENTIATION OF, such pathologic affections that are disturbing vision and ocular function in a given case, IS QUITE ANOTHER MATTER.

All the facilities of a modern laboratory and the SKILL of one trained in the analysis of such information are required, to establish the CAUSE FOR the disturbance of vision or ocular physiology, and even these sometimes fail to isolate the specific cause.

Whether the Optometrist elects to use "extra ocular tests," or whether he has determined the PRESENCE OF a pathologic disorder to

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exist, by methods which directly test the visual apparatus, the final result is similar but not equal; in either case the patient is REFERRED to some other kind of practitioner.

However, the principal difference is that the former elects to DESIGNATE THE KIND of service that is indicated, while the latter refers the case to a qualified DIAGNOSTICIAN who will DESIGNATE THE KIND OF SERVICE NEEDED.

Looking through at the Fundus, without a predetermined plan of inspection, is like putting to sea without compass, chart, or rudder. A plan that will aid in the systematic investigation of the Fundus is suggested by the following outline:

Fundus Color

As to the interpretation of fundus color, there is no absolute standard by which to measure its normalcy; the REPEATED OBSERVATION of different eyes that present no visual defects, attributable to disorders of the fundus structures, will and must be the answer, because there would naturally exist a variation in the color for the different types of persons having HEALTHY eyes. The words Orange Red mean little enough, but are suitable to express what is meant by a Normal Passive Fundus.

PALE TYPE—Persons who present a Pale or Anaemic type of Fundus color will also as a rule exhibit a characteristic Pallor of the skin, lips, etc.

The outstanding clinical feature of their symptoms is that of FATIGUE, mentioned first usually in connection with their eyes; however, this is but a part of the GENERAL FATIGUE that these persons experience. In all that they undertake to do, a marked INABILITY TO SUSTAIN MUSCULAR EFFORT is greatly evidenced in the history and visual complaint.

These persons as a rule cannot, with comfort, sustain the NATURAL MUSCULAR EFFORTS required to maintain Accommodative and Convergence Fixation at usual reading distances, even though the proper Ametropic prescription is before the eyes, and the Accommodative and Convergence Amplitudes and Reserves are of quite normal AMOUNTS.

During sustained fixation at infinity, they will remark that they obtain a great sense of relief by closing the eyes; this would indicate that the mental mechanism of vision is also taxed to the limit to sustain PERCEPTION.

It is essential in the interest of the patient's comfort NOT TO OVERLOOK the importance of the smaller amounts of refractive and muscular defects, as these would but accentuate the feeling of fatigue; and furthermore, it is imperative for the Optometrist to realize that, in spite of the indicated need for lenticular assistance, this WILL NOT necessarily or entirely prevent the eyes from "getting tired." It is to be

remembered that the SEAT of the disorder is NOT located IN the eye, but merely manifested there.

Muscular and mental exercises for the correction and relief of heterophoria SHOULD NOT be undertaken, because that which would prove to be stimulating and invigorating to a robust person, would result in exhaustive work for these anaemic persons. It is better to provide lenticular and prismatic aid until this type recovers sufficient health and vitality to sustain NORMAL EFFORT.

In most of these cases the blood is lacking in those vital and essential elements that promote normal reactions to the nerve stimulus. This in turn then affects the functional capacity and ability of not only the ocular structures, muscles, retina, etc., but the cells of the entire body, and accounts for the symptoms of GENERAL FATIGUE.

This type will frequently remark that while the light causes no pain, or other form of undue distress; it nevertheless "tires their eyes" when exposed to the sunlight for any length of time, and that it is "much more pleasant in the evening, but then I cannot see so well." This is undoubtedly due to the lowered sensibility of the retina, and he who prescribed tinted lenses for the relief of the first mentioned condition must not overlook the fact that such tints are useless for evening wear, for which a white pair should be given. Occasionally when the ametropia is of small or moderate amount, they will not wear their glasses in the evening, remarking that "I see better without the glasses; things seem clear." (Brighter) From this it appears that the slight loss of incident light (about 8 per cent) due to reflection and absorption, is noticeable to this type of person.

It is but the exercise of average intelligence to LIMIT the usefulness of any refractive prescription in the light of the above factors, which cause vision to be annoying or uncomfortable.

HYPERAEMIC TYPE. Those who possess the HYPERAEMIC type of fundus present a symptomology and physiology much different from the previous one. Here we have EXCESSIVE blood supply, and the cells composing the ocular structures involved, react to this condition by manifesting increased activity.

PHYSIOLOGIC factors in the production of Hyperaemia are: Sustained muscular contractions, as, for example, uncorrected facultative hyperopia; excessive accommodation in prolonged near work; the various heterophorias, and also abnormally large pupils.

PHYSICAL factors inducing this condition are excessive exposure to glare of sun, electric arcs and furnaces, etc., but if such exposure is of daily occurrence, then, after a variable period of time (one or more years), there will result a decreased sensibility of the retina, of which we will speak later.

Most all impending or actual pathological affections cast their shadows before them, in the form of congestion and hyperaemia of the

part affected; therefore, it is important that such condition be noted by observation of the fundus.

Hyperaemia is to be taken, therefore, as the OBJECTIVE SIGN OF IRRITATION. Such irritation may be due to PHYSICAL, PHYSIOLOGICAL, or PATHOLOGICAL CAUSES, and it is most important that the proper differentiation of such factors be made, to the end that intelligent service will result.

Since the cells composing all the structures exhibit an increased irritability (responsiveness) in the presence of excessive blood supply, some interesting deductions are possible, which have a direct Optometric value.

The retina is photo-statically adjusted to the various intensities of illumination, largely by means of Rhodopsin or Visual Purple, a product found in the rods of the retina; and, since the materials for the formation of this substance are derived from the blood supply the retina will manifest an increased sensitivity, this being usually expressed by the term, photophobia.

It is to be noted that the great MAJORITY of cases that complain about this intolerance of light have relatively SMALL PUPILS, therefore RECEIVE LESS LIGHT than the ordinary eye, and surely this inconsistency is positive evidence of the altered or abnormal physiology of the retina.

To prescribe tinted lenses indiscriminately, is but a means to ignore or conceal the true condition responsible for the intolerance and dread of light, and if there is but one thing (?) in Optometry that constitutes UNSCIENTIFIC PROCEDURE, it is the haphazard and mischievous manner in which tinted lenses are prescribed.

If the resulting fundus hyperaemia is due to the excessively stimulated ciliary muscle, it will, alone with the symptom of photophobia, be eliminated when proper refractive measures are prescribed. If, on the other hand, it is due to impending or actual pathology, it will not be eliminated.

Whether tinted glasses are given for temporary wear or for constant wear, in the above type of case, in every instance a WHITE pair should be given for evening use.

While a sense of relief may be secured by wearing tinted lenses in the sunlight, with its 4,000 to 8,000 F. C., they are frequently not worn in the evening; and if, because of the moderate to high error of refraction, they do wear them, they are prone to remark and complain of the dimness of their vision at night.

If a large pupil is regarded as the primary cause for the fundus hyperaemia, then a tinted lens may be constantly necessary in the daytime, but a white glass will prove to be much more satisfactory in the evening.

If the history indicates that the fundus hyperaemia is due to a recent exposure to a welding arc, furnace, etc., which can, and does occasionally result in more serious defects, it would be the height of unscientific procedure, to prescribe a tinted lens without, at the same time, requesting or insisting upon, a visit to an Ophthalmologist.

If the hyperaemia is due to disease of the vascular system, as revealed by inspection of the blood vessels of the fundus, then tinted lenses may serve for the purpose of relief; but this may be temporary, and darker lenses be requested. In the interest of the patients' welfare, they should be provided with such optical aid as is indicated, and requested to visit the general practitioner or diagnostician.

To look at the fundus, and see "nothing" or to see something which arouses no sense of recognition, nor subsequent interpretation; or worse yet, not to look at all, must, in the light of modern and sincere Optometric service, be construed as professional negligence.

Fundus Pigmentation

The appearance of the fundus, when the choroidal pigment is excessive, or deficient, is very characteristic, and can be observed with ease. The general arrangement of the fundus structure will prove of interest. Posteriorily, we have the white concave form of the sclera. Directly in front of this, we have the choroid, with its pigment and numerous blood vessels, and in front of this we have the retina.

The sclera alone would act as a splendid reflector, while the reflection from the choroid is dependent upon the color and density of its pigment and the position of the blood vessels. The retinal structures, being almost transparent, present but surface reflection.

AVERAGE NORMAL. Now when the pigment in the choroid is just of that degree of color and density, that the returning light from the INTERVASCULAR spaces is equal to that which is returned from the blood column in the blood vessels, then the fundus will show a quite even textured appearance, with varying shades or tints of orange. This is the average normal type of fundus, and denotes balanced pigmentation.

An eye of this type can be considered properly equipped to receive the ordinary intensities of light without arousing sensations of discomfort. If, however, such a fundus reveals a hyperaemic condition, then positive evidence is at hand that irritation is present, which may as before stated, be induced from physical, physiological, or pathological disorders. It is for the Optometrist to determine these facts.

RECTILLATED FUNDUS. If the choroidal pigment is deficient, then more light will be returned from the intervascular spaces than from the blood column in the vessels; this will give a streaded or striped appearance to the fundus, and is recognized by the fundus showing darker shadowy streaks on a lighter background.

Many of the blonde and sandy complexioned type possess this kind of a healthy fundus. To withhold a tinted lens from these people, for constant wear in daylight, is committing a breach of Optometric service, equal to that when such lenses are given for constant wear for relief of photophobia derived from pathologic disorders. Furthermore, the tinted lenses that will promote a sense of comfort for ordinary illumination, will not suffice as a rule for exposure to greater intensities, it is but the practice of intelligent service to give these people a darker tint for such special occasions.

It is known that Visual and Brightness Sensation is not in linear proportion to the change of intensity of illumination at the source, and this factor of such sensations, varies according to the Adaptation ability of the eye, Intensity and Character of the Primary Stimulus, extent of the change made therein, and the nature of the background.

When considering the Rectillated type of fundus, it is of importance to the Optometrist to know these principles, to the end that tinted lenses may be given intelligently. If a hyperæmic condition, from physiological causes, co-exists with this type of fundus, a pronounced intolerance of light will be experienced.

Rectillated Fundus. Without question cases of this type would experience a measure of relief from the correction of the hyperopia, but it would be useless to expect the intolerance of light effect to be entirely eliminated, since a part thereof is due to the deficient pigmentation of the choroid.

Intolerance of outdoor light generally is an ever-present symptom for those who possess the rectillated type of fundus, and the History will reveal that this sensation of EXCESSIVE BRIGHTNESS is of almost life-long duration.

Tessellated Fundus. When the choroidal pigmentation is EXCESSIVE, the light returning from the intervascular spaces will be less than that received from the blood column in the vessels, and in consequence of this, the fundus will show a streaked or striped appearance, but in contradistinction to the rectillated type, this will be revealed as lighter colored SHADOWY STREAKS UPON A DARKER BACKGROUND, and in addition to this, the whole color reflex is of a much darker hue, than the former type.

Such an eye, from its dense pigmentation, could and should be able to receive more light than either of the preceding types without arousing a sensation of discomfort. Those of the darker complexions usually present this Tessellated type of fundus.

When the symptom of photophobia is recorded in the History of such cases, it is positive evidence of ABNORMAL physiology, and is but rarely due to physical causes. If due to physiologic causes, the excessive brightness effect will disappear when the Accommodative or Heterophoric factor is corrected.

Tessellated Typed. Since most of these eyes normally possess a relatively large pupil, they regularly receive without distress, MORE light than others and therefore in most cases of this type, who have reason to complain of the brightness effect, an impending or actual pathologic condition would be suspected as the cause. This is where the value of the Campimeter and Perimeter is manifested, for the data obtained from these tests, (when ophthalmoscopic signs are negative), will positively determine the NATURE (physical, physiological, or pathological) of the irritation.

Stippled Type. From the general observation, it is usually inferred that the retina is perfectly transparent, but it must not be forgotten that the retina is possessed of an epithelial pigmentary layer, which differs from the choroidal pigment, that of the retina being deposited in microscopic dust-like particles.

When this pigmentation of the epithelial layer is EXCESSIVE, the fundus reveals a rough, sandpaper appearance, like the appearance of a newspaper photo under magnification, hence its name, "Stippled" Fundus. This type of an eye is also splendidly equipped to receive light, and if the physiologic factors are of a minor degree, further reliable information can be maintained from the date of the campimeter and perimeter.

Except in high hyperopic cases, INCREASED REDNESS of the Optic Disc is always an indication of irritation, the nature of which should be determined. When the physical factors are absent in the history, such redness should be construed as evidence of impending or actual pathology, because the visual reactions experienced are not explained by the error of refraction, etc. The campimeter and perimeter will disclose evidence in these cases, which will determine the NATURE (not cause) of the irritation.

To prescribe tinted lenses to these persons without being aware of the tell tale indications of abnormal physiology, is another serious breach of Optometric Service.

Pallor of the Disc, or unusual whitish appearance, associated with irregular visual reactions, calls for campimeteric investigation, as such signs and symptoms are direct indications of pathologic affections.

DO NOT WAIT UNTIL THE PATIENT COMPLAINS ABOUT PAINS IN THE EYE. The pathologic affections which involve the fundus structures, rarely ever cause the sensation of pain, but all are capable, and do cause irregular and abnormal visual reactions when looking at letters, colors, lights, and in some instances, when the eyes are closed. The trio of Ophthalmoscope, campimeter, or perimeter, and PROPER INTERPRETATION, will rarely fail to determine the character of the visual affection.

Blood Vessels

Regardless of the fine AMOUNT of accommodative and convergence amplitudes and reserves, and exactness of the ametropic correction, it

is useless to expect that eyes will function with normal efficiency, when certain VASCULAR DISORDERS are present, in a given case.

The Arteries are the carriers of NOURISHMENT, while the Veins and Lymphatics are the carriers of WASTES, which NORMALLY accrue from cellular activity, and the FUNCTIONAL INTEGRITY of the ocular structures (muscles, nerves, retina, etc.) is directly DEPENDENT upon the QUALITY and QUANTITY of such Nourishment supply, and Waste drainage.

When the muscle tissue is affected by depleted and insufficient nourishment (anæmic types), or by inadequate drainage of TOXIC products, the efficiency of a prescribed pair of glasses may be very disappointing. This can be ascertained in ADVANCE, from the history of the case and from the history of the date obtained by an INSPECTION of the blood vessels of the retina. FATIGUE is the dominant complaint, and while every optical means should be provided for the correction of ocular errors, such aids should be given with RESERVATIONS.

Those who attempt to EXERCISE the extrinsic muscles, and the cerebral or brain cells, for the correction of fusional or heterophoric defects, will find that these cases respond but FEEBLY, and as a rule, the gain registered in the ductions and reserves decline rapidly after the course of exercises is stopped. Such cases are considered "difficult" or unsatisfactory.

Much of this unfortunate optometric experience can be avoided, by regularly making an inspection of the retinal blood vessels, and noting the history.

Some cases exhibit an EXCESSIVE degree of functional activity (spasmodic, erratic, etc.) and are also usually derived from vascular disturbances, but in this instance, the various cells are reacting to excessive nourishment, or perhaps toxic factors. The red, flushed appearance of the skin, the quick movements, the history of profuse perspiration on slight exertion, the frequency of urination, etc., are common factors indicating a vascular disorder. It is useless to prescribe a FULL correction for faculative hyperopia or accommodative needs in these cases, the "glasses are too strong," "they bother me," etc., are common remarks. Ocular relief will be experienced to the greatest extent when the optical aids will permit some degree of CELLULAR WORK, therefore, a reduced correction will suffice for a while. When, and if the Vascular Disorder is rectified, then further correction can be made.

These persons usually manifest an abnormal ability to endure functional effort, induced by ametropic and heterophoric defects, coming later than the average for the first presbyopic glasses, etc. As a rule such persons RESPOND TOO QUICKLY to the various methods of physiologic exercise, showing huge gains in duction at each visit, and the continuance of the increased innervational response is subject to much variation.

In the later stages of this type of vascular affection, FATIGUE will be manifested in the history, perhaps due to the "worn out" condition of the cells from long continued excessive activity. A full correction will be readily accepted at this stage.

The importance of "optometric" inspection of the fundus blood vessels cannot be over estimated, because they may reveal the only reason for the abnormal visual experience of the patient.

To properly inspect the blood vessels, the operator's attention should be directed to:

(a) The individual and comparative SIZE of the vessels.

(b) The REFLECTIONS from the walls and blood column.

(c) The character of the COURSE they pursue across the retina.

(d) The INTERSECTIONS and evidence of PULSATIONS.

In concluding let me say that I have tried to present only such salient points as have an every day application in the Practice of Optometry.

It is well to remember that Vascular Diseases are very common, and these people are coming to you, as well as to others, for the answers to the QUESTION:

"What is the matter with my eyes?"

Who is there among us that wishes to assume the responsibility of failure to detect the PRESENCE of such affections, and at a time when, perhaps, our advice may be the means of preventing more serious loss of vision, and health!

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MINIMUM OPTOMETRIC PROCEDURE*

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What constitutes minimum optometric procedure? What group of the various eye tests must be made to produce a satisfactory and an authoritative finding? The writer will not presume to answer the question with finality, but will rather attempt to discuss the matter in such fashion as to bring to bear upon it the best comment he has been able to hear and a few ideas of his own.

Without doubt, too little careful thought has been given to the last purpose of optometric examination. Too little regard has been given to the intent of the patient who appears before the optometrist asking for that examination. It may be enlightening to analyze the patient's demand. Ignorant of all technical details of examination or remedial application, he once experienced the satisfaction of clear, comfortable, single, binocular vision. He wants it back again—that is all. If he cannot have it, he wants to know why. How shall the optometrist give him what he pays for?

Certainly, the optometrist of today should realize that his field has gone beyond the eye tests of yore, or the refraction of yesterday, and has become literally eye-diagnosis. The word, diagnosis, denotes and connotes a completeness of examination and a thoroughness of understanding worthy only of a professional man. If this is true, an examination that leaves out one step that may be essentially pertinent is not diagnosis. Let us outline in layman's language what we must find out about a patient.

First: The examiner must have a right to know and record the patient's past working condition. Here he will record the troubles subjectively reported and objectively discovered that brought the patient to his door.

Second: The examiner must determine the present working condition of the patient's vision. By scrupulously careful instrumental test

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and measurement he must record the immediate ability of the pair of eyes before him.

Third: The examiner must apply himself to the task of determining by various tests and mature judgment the patient's capacity for continued use of his eyes from the present to the time of the next examination.

Fourth: Where the first three steps have revealed a condition not immediately correctible, whether optometric in nature or otherwise, the examiner must be prepared to outline and apply corrective treatment in the optometric field, or make the necessary investigation so that his patient may be referred to the right profession for co-operative diagnosis and treatment.

If the reader will now accept the four steps just offered, we shall transpose them into optometric language and technique. In the following outline certain steps may appear in one of the four main divisions, when they seem to apply equally well to another, but they are placed in the groups where they seem to yield the most information.

I. Past Conditions.
   1. Subjective history, including name, address, age, etc.
   2. Corrections prescribed and/or worn previously.
   3. Visual acuity.
      (a) Without correction.
      (b) With last correction.
   4. Habitual phorias.
   5. General observation of patient.

II. Present Conditions.
   1. Ophthalmoscope.
   2. Ophthalmometer.
   3. Interpupillary width.
   4. Skiametry, static and twice dynamic.
   5. Subjective recheck.
   6. Amplitude of accommodation.
   7. Visual acuity, best obtainable.
   8. Short test for stereopsis.

III. Future Capacity.
   1. Induced phorias.
   2. Ductions.

IV. Treatment Service.
   1. Optometric, such as the myologic unit, the kratometer, the phoro-stereoscope, prism lenses.
   2. Extra-optometric, such as perimetry, transillumination, sphygmomanometry, laboratory analysis.

It seems reasonable to the writer to assume that all of the steps in the first three groups are essential, and that those in the fourth group may become so, but properly enough particular emphasis may be placed upon certain ones that are too frequently omitted, or done in inaccurate fashion at best in optometric offices.

Too seldom indeed are the phorias recorded with the patient's old correction, and it is particularly important that such test be made with the patient's actual glasses, wherever possible. Too little effort is made to size up a patient as a patient, although a very serious effort frequently is made to size him up as a spectacle buyer.

It is timely to place before the great body of optometrists the need for a more thorough use and understanding of the ophthalmoscope. Suffice it to say here that this is the dawn of ophthalmoscopy, when it will no longer be an instrument used to discover how much damage has already been done. Its tremendous possibilities in the preventive field, or at worst, as a means of commencing treatment in the early stages of a dangerous condition, are beginning to be realized.

From the refractive standpoint emphasis should be placed upon the value of differential diagnosis based upon the ophthalmometer and the three skiametries. It will be brought out more comprehensively later with actual cases how this analysis presents much practically useful knowledge of a case, but attention is directed to it now with this in view. It has been the writer's observation that skiametric findings are less likely to agree with ophthalmometric findings as the fixation point of the patient recedes from his eye beyond the distance at which he was fixing while the ophthalmometer was used. This tends to indicate that the lenticular and extrinsic compensation is most active at the distance of least demand upon accommodation. If so, a study of the four findings will enable the examiner to determine more accurately the cylinder most acceptable to the patient according to his ultimate needs and habitual vocational requirements.

It may not be amiss to digress for a moment from the main theme to say more with regard to the interpretation of ophthalmometric findings. When the two principal meridians are found vertical and horizontal, it is very easy to determine the axis of the cylinder. When, however, the two principal meridians are oblique, another problem is presented. Experience has permitted the writer to offer a somewhat indefinite rule, as follows:

Considering minus cylinders, when the axes are oblique, the corrective cylinder will assume an axis farther from the horizontal than the ophthalmometer indicates. The amount of variation in axis will vary in inverse proportion to the strength of the cylinder indicated. Examples:

Case No. 1. Ophthalmometer:
O. D. 44.00, 45.25 with rule axes 15° and 105°
O. S. 44.00, 45.25 with rule axis 165° and 75°
Static skiametry shows axes: O. D. 25°
O. S. 155°
Old ℞ had axes: O. U. 180°
Corrective cylinders applied:
O. D. — 0.75 axis 20°
O. S. — 0.75 axis 160°

Case No. 2. Ophthalmometer:
O. D. 42.00, 43.50 against rule axes 10° and 100°

O. S. 41.75, 42.75 against rule axes 165° and 75°
Static skiametry, subjective, and corrective cylinders applied:
O. D. — 1.75 axis 95°
O. S. — 1.25 axis 85°
Case No. 3. Ophthalmometer:
O. D. 45.50, 46.00 with rule axes 160° and 60°
O. S. 45.50, 46.00 with rule axes 15° and 120°
Static skiametry, subjective, and corrective cylinders applied:
O. D. — 0.25 axis 110°
O. S. — 0.25 axis 70°

To continue the main subject, it was not taught for many years that exact fixation and the use of a fixation check was essential to accurate skiametry. This is easy today and well done with modern instruments, such as the Tait Dynamic Retinoscope, in dynamic skiametry, but it is still neglected in static skiametry.

Still along the line of fixation, something might be said about phorias and ductions. When the examiner arrives at his third group of tests, where he wants to know whether his approximate correction will or will not do the work in practical use, he is under the necessity of having the patient again maintain intent fixation, thereby simulating the ordinary working condition. Since useful phoria and duction tests require such fixation, much might be said about the best kind of stimulus, particularly at infinity. It is probably the opinion of most of our best minds that a single line of characters of the size of the patient's best obtained visual acuity placed at right angles to the direction of stress becomes the most satisfactory test object for ductions. In contrary manner, it should be placed parallel to the direction of stress for phorias.

These detailed comments on certain steps in the technique have been made because of a persistent negligence on the part of refractionists generally in making their tests in the best possible way. One great step forward may some day be made, when adequate investigation has revealed the correct standards on which findings should be based. On the subject of charts alone study would reveal vast differences and provoke some hearty laughs.

This concludes a brief discussion of the gathering of basic facts. What shall we do with them? May we not scratch the surface of differential diagnosis? Truly enough, differential diagnosis is based on a series of norms. The insurance actuary has his tables of life expectancy. The optometrist has in his experience his tables of ocular expectancy. Then differential diagnosis is merely a matter of discovering how far the findings in a given case vary from what the law of averages says should be expected in that case. By way of illustration, a few actual cases are presented for analysis, showing how diagnosis is accomplished.

Case No. 1: Miss M. B., age 38, occupation, stenographer. Patient complained of frontal temporal and occipital headaches, these started each day about 11 A. M. Some ocular congestion and patient

also experienced a little difficulty at near point. The ophthalmometer showed about one-half of one diopter of astigmatism with the rule. The uncorrected visual acuity was 20/30. The static skiametric findings were O. D. plus 1.25, O. S. plus 1.25. The dynamic skiametric findings at 20 inches were O. D. plus 2.25 and O. S. plus 2.50. The Tait Dynamic System of Skiametry gave a net after reduction for P. E. of O. D. plus 1.50 and O. S. plus 1.75. The subjective findings were O. D. plus 1.25 and O. S. plus 1.50, and the amplitude of accommodation was 6.5D. The habitual phorias were as follows: 2 degrees of esophoria at 6 meters and 1 degree of exophoria at the near point. The induced or corrected phorias were as follows: 1 degree of esophoria at a distance and 5 degrees at the near point. The ductions were as follows: The true induction at 6 meters was 6 prism diopters, the accommodative induction was break at 28 prism diopters and recovery at 10 prism diopters. The abduction was break at 7 prism diopters, recovery at 4 prism diopters. The near point positive fusional reserve was break at 32 prism diopters and recovery at 12 prism diopters. The negative fusional reserve was break at 16 prism diopters and recovery at 11 prism diopters.

Briefly, the outstanding features of this case are these: The three skiametries reveal a willingness to accept more plus at the point of greater stress. This is shown in the more-than-expected accommodative lag at the twenty-inch distance, and in the greater net findings with the Tait method. The habitual phorias reveal a condition which may be either a problem in innervation or pathology. However, the reduction of the esophoria and the increase of the physiological exophoria with the plus correction is good evidence that there is no pathology. This is further supported by the ductions, where there are no minus reversions nor are there three very low reversions. A further analysis of the ductions shows that the convergence has been over-stimulated by the habitual accommodative necessity, and the reversions being slightly low indicate a fatigue. In consideration of all of the findings, there are not the characteristic contra-rule indications that warn of pathology. There is no serious problem in refraction or innervation, although both must be considered. The problem resolves itself to one of judgment as to whether the application of the proper amount of plus will relieve the difficulty. The phorias and ductions say it will. The ophthalmometer and retinoscope are in near enough agreement to say that plus sphere will suffice. Since the subjective findings reduced the esophoria, but did not reduce it to orthophoria, and since the skiametries indicate some latent hyperopia, it is reasonable to assume that + 0.25 more sphere O. U. will be acceptable for general wear. It was prescribed as shown on the case record and it worked.

Case No. 2: Miss D. M. S., age 39; occupation, housewife. Patient complained of having very little strength and being extremely nervous, particularly during the past several weeks. In this case, the ophthalmoscopic picture showed the nerve heads clearly outlined, veins and arteries tortuous, the physiologic cup appeared normal in depth

with a general muddy and congested appearance of the fundus. There were 2 diopters of corneal stigmatism in the right eye with the rule, and 1½ diopters with rule in the left. The uncorrected visual acuity was as follows:

O. D. 20/100
O. S. 20/30

The Static Skiametric findings were as follows:

O. D. + 2.25 ⊂ — 1.25 axis 175
O. S. + 2.50 ⊂ — 0.75 axis 5

The Dynamic findings at 20 inches were as follows:

O. D. + 3.00 ⊂ — 1.25 axis 175
O. S. + 3.25 ⊂ — 0.75 axis 5

The Tait Dynamic findings at 13 inches were as follows:

O. D. + 4.50 ⊂ — 1.50 axis 180
O. S. + 4.75 ⊂ — 1.00 axis 180

The Subjective findings were as follows:

O. D. + 2.50 ⊂ — 1.25 axis 180
O. S. + 2.75 ⊂ — 0.75 axis 180

The amplitude of accommodation was 5.5 diopters O. D. or O. S. The habitual phorias were 1° of exophoria at 6 meters and 12° at the near point. The induced phorias were ½° of exophoria at 6 meters and 11° at the near point.

At 6 meters the true induction was 2 P. D. and the accommodative induction was break at 18 P. D. and recovery at 8 P. D. The abduction was break at 6 and recovery at 4 P. D. The near point positive fusion reserves were break at 18 P. D., recovery at 0. The negative fusion reserves were break at 20 and recovery at 17 P. D.

The subjective history alone becomes a warning that cannot be ignored, but let us see if she is reporting symptoms that are without cause. The habitual phorias indicate a fatigue which will show all through the analysis. Genuine trouble is indicated in a comparison of the ophthalmometer and the three skiametries. When the cylinder acceptable is less than expected and also less than the cylinders in her old correction, why? When the static and twenty-inch dynamic skiametries are in accord, and the thirteen-inch dynamic is so far from the expected, we have a definite indication of a let-down of normal activity. Why? When the subjective recheck shows more plus to be acceptable for best vision than the skiascope shows, it is always a *possible* pathology. Is it true or false? When the visual acuity cannot be brought to 20/20 or near it, and can not be equalized in the two eyes, particularly in a case where it has been before, toxic amblyopia is probably the explanation. The amplitude of accommodation in this case shows an irregularity that relates directly to the inducens and directs the attention instantly to all of the ductions. Those taken in the morning show a fatigue picture with a locked relationship between accommodation and convergence. Those taken in the afternoon show a more pronounced like condition. With three low ductions and reversions and one reversion actually negative, we have a strong indica-

tion of pathology as the cause of the fatigue, which in this case approaches exhaustion.

The ophthalmoscope has been ignored to this point, because its indication to the writer was not as emphatic as might be expected from the other findings. An explanation of the conditions actually found may show why. Color field studies were made. Some abnormalities appeared in all fields with the radically reduced green field outstanding. The patient was referred in accordance with all tests, and a complete clinical examination revealed a condition of focal infection entirely in the lower abdomen and pelvic region, the appendix and one ovary being the main sources. Hence, the source of infection being relatively far from the eyes, the ophthalmoscope did not show as bad a fundus as might have been expected. Subsequent to some surgery, the patient will reappear for refraction.

Case No. 3: Miss W. B., age 21; occupation, student. Patient complained of slight frontal headaches, her eyes also would smart, itch and burn after studying, no appreciable amount of astigmatism was indicated by the ophthalmometer and ophthalmoscopic picture was negative. The patient's uncorrected visual acuity was 20/25.

The Static Skiametric findings were as follows:

O. D. + 0.75 ⊂ — 0.50 axis 90
O. S. + 0.75 ⊂ — 0.50 axis 90

The Dynamic findings at 20 inches were as follows:

O. D. + 1.25 ⊂ — 0.50 axis 90
O. S. + 1.25 ⊂ — 0.50 axis 90

The net Tait Dynamic findings after reductions for P. E. 12 were as follows:

O. D. + 0.75 ⊂ — 0.50 axis 90
O. S. + 0.75 ⊂ — 0.50 axis 90

The Subjective findings were as follows:

O. D. + 0.50 D. Cyl. axis 180
O. S. + 0.50 D. Cyl. axis 180

The amplitude of accommodation was 10 diopters. The habitual phoria was 6° of exophoria at 6 meters and 16° at the near point. The induced phoria was 6° of exophoria at 6 meters and 18° at the near point. The true induction was 6 prism diopters and the accommodative induction was break at 23 and recovery at 3 P. D. The abduction was break at 15 and recovery at 13 P. D.

The near point positive fusion reserve was break at 12 and recovery at — 4 P. D. The negative fusion reserve was break at 28 and recovery at 26 P. D. Fusion analysis revealed a definite suspenopsia in which the left eye was the chief offender.

In this case it will be interesting to call attention to two indications of pathology which proved to be other than pathology. First, a radical disagreement between the skiametries and the ophthalmometer may be taken for a sign of pathology; second, a negative reversion after measuring the positive fusion reserve may be so considered, as was in Case No. 2, just previously reported. Why are they not here found to be pathologic in cause?

The case as a whole is a radical exophore, and a careful analysis shows all phases to be in agreement. The subjective is less plus than the static skiametry. The less than expected lag in the twenty-inch dynamic skiametry is easily explained by the excessive stimulation required in this case to the ciliaries when convergent fixation is demanded in the face of the exophoria. The visual acuity obtained in the case is not quite 20/20 but can be readily understood. The most interesting side of the case is the constant astigmia against the rule, when the ophthalmometer says it should not be. However, since this patient for some years has been exerting the extrinsic muscles in no normal fashion, and has been maintaining a decidedly abnormal balance between the functions of accommodation and convergence, it is reasonable to assume that such imbalance is responsible for the physiologic astigmia discovered. Faced with these facts the refractive problem becomes nothing. The pathologic problem must be eliminated, and to be perfectly certain, in spite of a negative ophthalmoscopy, color field studies were made and revealed nothing. This leaves the case as a problem in innervation and becomes more interesting in view of the suspenopsia revealed in the fusion analysis.

* * * * * *

These three cases are offered to show in brief fashion how logical consideration of basic facts will reveal true sources of trouble. They are also offered to show how each step in this procedure is essential to correct diagnosis. They are offered to demonstrate that often an individual negative finding, instead of being the result of a test uselessly made, is positive proof of something. A conclusion can well be reached that a procedure such as the one outlined is not too complete, and that one which eliminates any of these essential tests is inadequate.

It does not mean that many other tests should not be made. It does not mean to criticize those men who have spent years in detailed investigations along specialized lines. It does mean that there are comparatively few cases that require special investigation. It does mean that the great mass of cases is crying for accurate diagnosis by a capable optometrist—accurate diagnosis of the simple uninteresting case, perhaps, but a case which is that patient's big source of grief when he asks for examination.

The writer believes that professional optometry will grow in power and recognition, when it has prepared itself to handle every case as nearly flawlessly as the human element involved will permit. That time will not come so long as optometrists continue to omit essential tests and ignore the meaning of recorded data. On complete diagnosis depends optometry's success. Let us discover what our standards of diagnosis should be, establish them, practice them consistently, and succeed professionally.

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POORLY MADE INSTRUMENTS

Ocular Myologic treatment work is apt to be set back unless those who are able to do so will convince certain manufacturers of the error of their ways. These men who profit most in this field are at fault in several ways. In the first place many instruments are poorly made and the prices charged the optometrists for these are in most cases exorbitant, and secondly, the claims made by the manufacturers and their salesmen who go about selling this stuff are for the greater part fictitious and excessive. Again there is a tendency to flood the market with all forms of apparatus some of which are mere toys though others have some merit. The outcome of this is bound to be disastrous to ocular myologic treatment work.

Whether or not the instruments have virtue, the essential factor of brains back of the instrument is in many cases missing. There is value in ocular myologic treatment work when properly applied to certain neuro-muscular disturbances but some doctors have become so over enthusiastic as to conceive it as a cure-all, and have even discontinued

the use of indicated remedies. On the other hand many doctors have purchased instruments altogether on the basis of propaganda from certain irresponsible manufacturers without the knowledge of their proper use. While these men will fail, they will create in the public mind a low estimate of this optometric technic. The greatest difficulty lies in the cupidity of these manufacturers who introduce all sorts of instruments and place them in the hands of uninstructed optometrists by high pressure salesmenship.

There must be a way to call a halt to such ill-advised commercialism. If not ocular myologic treatment work will suffer unjustly.

C. C. K.

EYEGLASS INSURANCE

For the third time in the last ten years optometrists are being urged to sell insurance on the optical material they have prescribed. The first two attempts ended in such failure that it is surprising that anyone has the fortitude to again advance these ideas. Yet, nevertheless, individuals exist who are attempting to introduce the scheme to the public through the optometrist.

This the writer believes to be a mistake. In the first place let me say that the idea on the whole is psychologically wrong. The public does not go to professional men for insurance, nor is it considered ethical for professional people to get mixed up in such petty transactions as dollar insurance policies. The writer can conceive of nothing quite so cheapening as an optometrist, who, after completing a refraction and prescribing the necessary material turns to the sale of an insurance policy on this material.

I have no quarrel with insurance companies. Nor do I object to insurance on optical material. I do, however, object to optometrists being made the salesmen for this insurance. I maintain there never could be profit enough in this form of insurance to compensate an optometrist for the prestige he loses every time the thing is mentioned by him.

Suppose, for instance, you called on your family physician and were treated over a period of several weeks for some certain ailment. The day finally arrives when he tells you that he has finished, and that you are now cured and that you need come no longer. He says further that the fee is such-and-such an amount. Now at this point wouldn't you feel a bit surprised and somewhat indignant were he to continue by telling you of a splendid health insurance policy, the fee for which he would like to add to your bill? Wouldn't you unconsciously feel that this fellow was a bit too eager to make a profit to take care of you further? Wouldn't you unconsciously feel that such commercialized professional service was not exactly what you were seeking? Surely you would. Now isn't that an exact parallel? The physician is giving you physical comfort by taking care of your health. As optometrists we are giving our patients

visual comfort by prescribing certain materials to be used at certain times. Wherein is the difference? If it is unprofessional for a physician to "peddle" insurance to *his* patients it is equally unprofessional for any practicing optometrists to attempt it on his patients.

There are certain limits beyond which a professional man cannot go without losing cast. These limits are laid down through years of general and wide spread adherence to certain ideals on the part of all professional people and as these are accepted by the public at large as visible marks of professionalism they then must be observed by all who wish to be regarded as professional. Optometrists cannot set up their own set of standards or their own code of ethics. You are either a professional man or a merchant. There is no middle ground and as a merchant the future holds nothing but failure for you.

Therefore, let the selling of insurance to that group who specialize in that work, i. e., the insurance men, and as optometrists stick to the purely professional work which is ours.

C. C. K.

BOOK NOTICE

THE PHYSIOLOGY OF MUSCULAR EXERCISE, by F. A. Bainbridge. Published by Longman's, Green and Company, 55 Fifth Avenue, New York, N. Y. 272 pages, illustrated. Price, $5.00. July, 1931.

The present volume, which is the third edition of this work, has been rewritten by Bock and Dill. In this book is found a complete discussion of the latest findings in the science of physiology. Special emphasis is laid upon the physiology of exercise of the muscles of the body.

Of particular interest is the part dealing with the co-ordination of the changes occurring during exercise. The author points out the important part played by psychical processes in initiating physiological activity.

This book contains much helpful information for the student of physiology.

J. I. K.

ANNOTATIONS AND SOCIETY PROCEEDINGS

The American Journal of Optometry is the Official Organ of the American Academy of Optometry, as well as the Organ of the Arkansas, Delaware, Indiana, Iowa, Maine, Maryland, Michigan, Minnesota, Nebraska, North Dakota, Oklahoma, Pennsylvania, South Dakota, Vermont and West Virginia Optometric Associations.

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OPTICAL ADVERTISERS EXPOSED

We are herewith reproducing in its entirety an excerpt from the report of the Chicago Better Business Bureau dealing with "cut-price advertisers" among practicing optometrists in Chicago. The report was published on March 10th, 1932 and was sent to all members of the Chicago Better Business Bureau.

OPTICAL "BAITING" DECREASED

"Hokum and fake in this business under the circumstances, with the health of the eyes involved, is a particular type of greed that is almost criminal"—

Editorial—Journal of Commerce—2-8-32.

The statement quoted from the Journal of Commerce is a strong one—but not too strong. The writer probably had in mind the menace to public health rather than the offenses of unfair competition, fraud, or false advertising and yet the same statement might be applied in the latter sense with equal justice. The practice of optometry requires specialized education and is subject to a state licensing board. Consequently one might reasonably suppose that ethics in this field would be approximately on a par with those prevailing in such fields as pharmacy, chiropody, or barbering. Any one believing this, however, most certainly would be very far from the truth.

WHY NOT?

There are several reasons for this. Barbers and chiropodists as a rule can't afford to advertise widely so the temptation to misrepresent in print is minimized. The pharmacist fills an order from an M. D.'s prescription, and without discretionary powers there is no opportunity for "switching" to a "more suitable" prescription. The optometrist on the other hand himself examines the patient, prescribes and furnishes the merchandise.

Style is an important element in optical wares. Technical terms such as "spherical," "toric," and "astigmatic" may conveniently be used as an excuse for refusing to sell merchandise at advertised prices. And perhaps most important of all is the fact that a fiduciary relationship, a relation of trust, exists between the patient and optometrist. The patient feels that he need not deal "at arm's length" with an optometrist and he relaxes the vigilance which he might exercise in dealing with the vendor of a car, watch, or a necktie.

THE RESULT

The result has been that some optometrists have taken advantage of these natural opportunities to gull the public and have taken an unfair advantage of the competitor who was handicapped by a normal sense of decency. This has been done through more means than one, but by all odds the most prevalent, most vicious and most difficult to control is the practice of *Baiting*.

SHORT COURSE IN OPTICAL TERMINOLOGY

In order to understand the technique of baiting in optometry, it is necessary to be slightly familiar with a few technical terms and facts. Broadly speaking, all patients may be divided into two groups: (1) Those without astigmatism, (who can be fitted properly with spherical lenses), and (2) Those with astigmatism, (who require lenses of cylindrical grinding). The vast majority of patients requiring glasses require some degree of astigmatic correction, hence specially ground lenses.

The smaller group of patients, variously estimated at from 5 to 20 per cent of the total, can be fitted properly with stock spherical lenses, requiring no special grinding, and which consequently can be sold at a low price. It is for the stock spherical lenses that advertisements have often quoted prices of $2.45, $2.95, and less. The price is featured in large type, while buried in the text appear the meaningless (to the general public) words, "finest spherical lenses."

The patient requiring glasses, and knowing nothing except that his eyes are bothering him, was told in about nine times out of ten that the glasses advertised were spherical lenses only and that his case required an astigmatic correction for which the cost would be, not $2.95 as advertised, but $8.50, $10.50, or $12.00. The patient either bought the glasses at the higher price or left, feeling that he had wasted a half hour on a "come-on" advertisement.

TONSORIAL PARALLEL

A similar situation in any of the other occupational fields we have considered would arouse a storm of public protest. Take a barber shop for example. If a man wants a haircut he walks into a shop which displays a price sign, gets the service offered, pays the advertised amount and leaves without further negotiation.

If barbers were to use the Bait technique, a large sign might be displayed offering "Haircuts 75c." A man, upon entering and seating himself in a chair, would be told that the 75c price referred only to bald headed men and since he was not bald the price must necessarily be $1.25.

Thus, translated into another occupation, the situation appears ridiculous, and yet the barber in this hypothetical case is doing almost exactly what certain advertising optometrists have been doing. Even the percentages are not far off. The ratio of bald men to the total requiring hair cuts is pretty close to the ratio of those needing only a spherical correction to the total number requiring glasses. Equip the barber with a few scientific terms such as "Brachycephalic," (short headed), "Megacephalic," (large headed); qualify the offering as "Finest Alopecia Hirsute Trimming;" and the situations are almost identical.

BAIT SPECIALISTS

Bait technique in optometry has been the subject of Bureau criticism over a period of five years. The advertisers who recently have been the most flagrant offenders are the L. Manasse Company, (operated by Dr. Clifford Mower), Wm. Meyer & Company (operated by Dr. E. T. Mower), Liggett's Optical Department, (operated

by A. C. Blond), Ritholz Optical Company, (President, Mr. Benjamin Ritholz). A resume of the Bureau experience with each of these firms follows:

L. MANASSE COMPANY

This firm is operated by Dr. Clifford Mower, registered optometrist. It has been the practice of this firm to feature a "Kryptok Sale Special" with the price $2.50 in large type. In the text appears the "joker"—(take a long breath)—"Genuine Toric Convex Spheric Bifocals." Of thirteen bifocal wearers selected at random who answered this ad between February 6th and 18th, only two (or 16 per cent) were willingly offered glasses at $2.50.

The other eleven were quoted prices of $7.50, $8.00, $10.00 or $10.50, and were told that in their cases the $2.50 glasses would not do. The Bureau has recommended that the copy of this firm be rejected by all papers unless the ad stated conspicuously that complicated cases and astigmatic corrections are not included at the $2.50 price.

WM. MEYER & CO.

Dr. E. T. Mower is in charge of the optometry department at this address. Advertising and practices have been much like those of the L. Manasse Company. Repeated copy has offered "Double sight glasses," with the price $2.50 featured in large type. On some occasions technical reservations such as "spherical" are included in small type in the text. On some occasions even this reservation has been omitted and two insertions included the phrase—"ground to order including astigmatism."

Of thirteen bifocal wearers who called at this location February 6th to February 18th, only one, (or 9 per cent) was willingly offered glasses at $2.50. In the remaining twelve cases the price asked for satisfactory glasses ranged from $5.00 to $10.00. In three cases the shopper insisted on buying the $2.50 glasses even after being told it was not exactly what was needed. The glasses in each case were flat, spherical, cemented bifocal lenses. Dr. Mower recently agreed to describe his $2.50 glasses as "Stock Glasses." The Bureau has recommended to all papers that his copy offering glasses at $2.50 be accepted only upon the condition that the words "Stock Glasses" appear prominently in the advertisement.

LIGGETT'S

The optical department here is a leased department under the management of Mr. A. C. Blond. Mr. Blond has in the past advertised glasses as low as $2.25, $2.95 and $3.15. Bifocals were recently advertised at $3.85. Included in the ad are such phrases as, "For reading, sewing, or distance," "For far or near vision," and "genuine toric spherical lenses." Extensive shopping in the past proved that the prices quoted did not apply to lenses in which astigmatism was corrected, the type of glasses required by far the greater percentage of patients. The excuse for not selling at the advertised price was the fact that the glasses advertised were for "far or near vision," but not for "astigmatism," and that astigmatic corrections were $7.00, $7.50 or more.

Between January 17th, 1932 and January 27th, 1932, ten Bureau shoppers called at Liggett's and attempted to buy glasses advertised at $3.35—or bifocal glasses at $3.85. Nine of these ten were unable to get the glasses at the advertised prices. The prices quoted were $6.50 and $7.50 for single vision glasses; $10.00 and $10.50 for bifocals. A tenth shopper by dint of much insistence succeeded in buying a pair of the advertised glasses.

In justice to this firm it should be mentioned that since February 1st, the time of the optometrical meeting, considerable improvement has been shown in the attitude toward delivery of advertised glasses. Twenty-seven shopping investigations were made between February 5th and 19th. In nine cases glasses were bought at the advertised price. In eight other cases the optometrist did not knock the advertised glasses and was willing to sell. In ten cases (37 per cent) the optometrist was not willing to sell at the advertised price, saying the glasses would not do.

RITHOLZ OPTICAL CO.

The principals in this firm are the Ritholz Brothers, Samuel, Morris, and Benjamin. Although relatively new in the retail field, the Ritholz family has been active in the mail order sale of glasses for years under the names of "Clearsight Optical Company," "Truefit Optical Company," "Chicago Spectacle Company," "Fitwell Spectacle Company," "Midwest Spectacle House," "Consumers Spectacle Company" and others. Under these names the Ritholz Brothers have in 1921 and 1928 signed stipulations with the Postoffice Department agreeing to discontinue certain unfair practices.

Investigations at the Ritholz, retail stores indicate that the price quoted in advertisements has little relation to the price asked of a customer for suitable glasses. In the past prices have been quoted as low as $1.98 for Kryptok Invisible Bifocals, and $1.48 for single vision glasses, "complete with eye test." In practically all cases the Bureau shopper was told that the glasses would not do for her particular case and that the proper glasses, including the correction for astigmatism, would be $5.98, $6.98, or $7.50.

More recently the Ritholz Company has featured glasses at $3.00 and $4.50. Bureau shoppers were informed that these would not be satisfactory for persons requiring astigmatic corrections. After the trade conference sponsored by the Bureau, Mr. Benjamin Ritholz agreed that if glasses were offered at a price, that price would apply to persons requiring astigmatic correction. Subsequent shopping proved that persons requiring astigmatic correction would be permitted to buy at the advertised price but were told that the lenses would be "flat" and that they could not get white gold filled frames.

Since nine out of ten persons answering ads offering gold filled frames intend to get the *white* gold filled frames, and since the "flat" lens is an obsolete type of lens which is seldom used and cuts down the wearer's field of vision approximately 16 per cent, it would seem that the Ritholz Company was not anxious to sell glasses at the prices actually advertised. Later copy was corrected to an extent and the offer was limited to "tan tone mountings." Though some improvement has been shown in the copy of this firm, none has been voluntary.

IMPROVEMENT NOTED

In addition to the firms mentioned here, investigations have in the past disclosed switching practices at the Fair, Goldblatts, Davis Co., Boston Store, and Schulte's. Since the adoption of standards much improvement has been noted at all of these stores.

CONCLUSION

More progress has been made in the last month in this field than in the previous five years. This is possible because of concerted action on the part of the decent advertisers and by virtue of the cooperation of newspapers in rejecting copy which has been proved misleading. The Bureau wishes to commend those papers who by referring copy to the Bureau before insertion have made possible this improvment. Though the results achieved so far are gratifying, much remains to be done. Continued support of honest advertisers is highly essential.

This is indeed a fine state of affairs when busy business executives have to leave their desks to clean up a situation which became so bad that even disinterested parties could no longer stand them. It also shows just how much harm a few individuals can do to the reputation of a profession by their thoughtless actions. Every profession is cursed with a few practitioners who for the sake of a few dollars will prostitute their science, yet it is seldom that any group have carried on in the manner outlined above, and it is indicative of the depths to which they are sinking.

The writer wishes, however, to point out at this time, that these unprincipled individuals have had to make the price of their so-called service lower and yet lower as the years rolled by to attract the public to their doors. Six or seven years ago by advertising $7, $8 and even $10 prices they were able to attract enough suckers to get by. Now, they are down to the $2 and $3 price and as the public is becoming wiser and wiser to their unscrupulous tactics even this low bait will fail more and more in its appeal. Their days are definitely numbered inasmuch as professional service of high quality and not incompetence at a price is what the public is demanding. C. C. K.

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PENNSYLVANIA OPTOMETRIC ASSOCIATION — An educational program sponsored by the Pennsylvania Optometric Association was held at Allentown on May first. Dr. Louis Jaques of California was the chief speaker. "Blur-point-Technic" being the subject.

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CONNECTICUT OPTOMETRIC SOCIETY — A clinical program was sponsored by the Connecticut Optometric Society the week of May second at Meriden. Dr. Skeffington was the chief clinician and a number of clinical meetings were held.

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SOUTH DAKOTA OPTOMETRIC ASSOCIATION — Dr. R. G. Coldberg of Aberdeen was elected president of the South Dakota Optometric Association at the annual meeting of that society at Sioux Falls, April 10 to April 12. Other officers elected are W. A. Fritz, Secretary, and Dr. A. F. Rounds, Treasurer. The next annual Convention will be held at Watertown, South Dakota.

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SPECIAL MEETING AT MINNEAPOLIS — Dr. Roy Peterson, President of the local optometric group of Minneapolis, has called a special meeting to be held May 18, at 6:30 p. m., at the Minneapolis Elks' Club.

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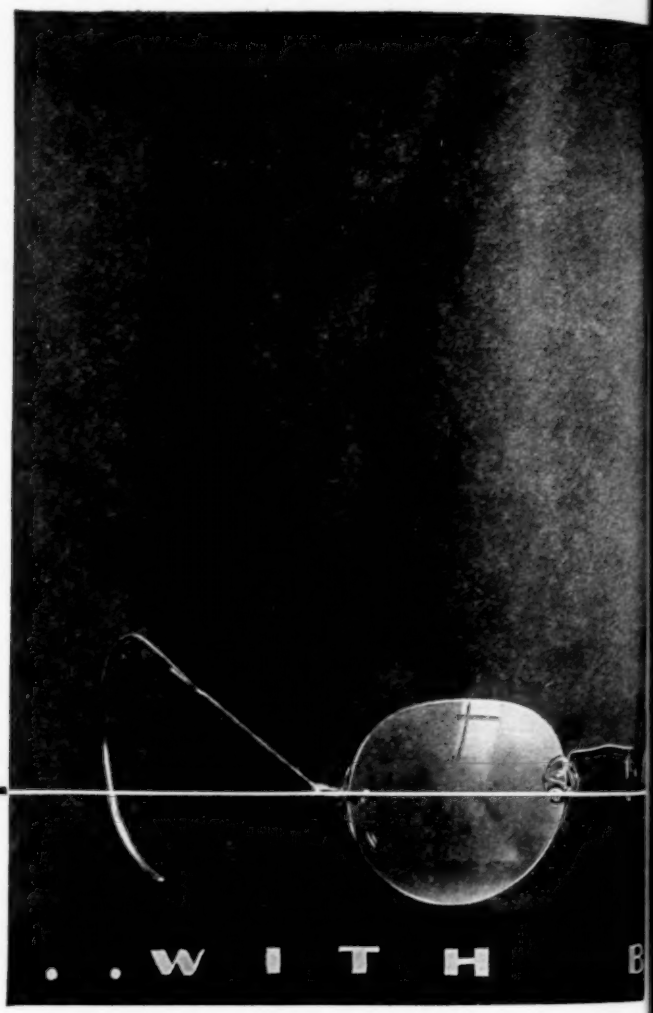
FERGUS FALLS CLINIC GROUP — Dr. E. W. Carlson, optometrist of Fergus Falls, Minn., has been appointed Chairman of a Study Group for that area under the Graduate Clinic Foundation. The meetings will be held on the second Tuesday of each month.

Balance



THE PELHAM

he semi-flexible Pelham with ★Bal-Guards is a **hit.** Practitioners nd patients both have welcomed the revolutionary features of his new eyewear style. Graceful of line, it is appealing to both en and women as an outstanding example of the wanted incon- picuous Eyewear. ★Bal-Guards contribute equally to this incon- picuousness and to its rare **balanced** comfort. •U. S. Patent No. 1,809,494.

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